

Commonwealth of Massachusetts



Influenza Pandemic Preparedness Plan

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Community Disease Control and Prevention
(adapted from Supplement 8 U.S. Department of Health and Human Services
Pandemic Influenza Plan)

RATIONALE

Once the spread of pandemic influenza beyond the initial focus occurs and with introduction of the virus into the United States, containment activities will be public health and individual measures that attempt to slow and limit viral transmission. Containment strategies aimed at controlling and slowing the spread of the virus, might of measures that affect individuals (e.g., isolation of patients and monitoring their contacts, personal protective measures, etc.), as well as measures that affect groups or entire communities (e.g., cancellation of public gatherings; implementation of community-wide snow days). Guided by epidemiologic data, the most appropriate of these measures will be implemented in efforts to maximize impact on disease transmission and minimize impact on individual freedom of movement.

Isolation and quarantine may have limited impact in preventing the transmission of pandemic influenza, due to the short incubation period of the illness, the ability of persons with asymptomatic infection to transmit virus, and the possibility that early symptoms among persons infected with a novel influenza strain may be non-specific, delaying recognition. However, implementing measures early in a pandemic when disease is first introduced into the U.S., and when the scope of the outbreak is focal and limited, may slow geographical spread and increase time for vaccine production and implementation of other pandemic response activities. Later, when disease transmission is occurring in communities around the U.S., individual quarantine is much less likely to have an impact and would not be feasible. Community-based containment measures (e.g., closing schools or restricting public gatherings) and emphasizing what individuals can do to reduce their risk of infection (e.g., hand hygiene and cough etiquette) may be more effective disease control tools.

Mathematical modeling suggests that travel restrictions would need to be about 99% effective to delay introduction into a country by one to two months. Based on these results, the goals of containment activities during a pandemic should be to slow the spread of disease early after introduction into the U.S. and to limit the number of persons who become infected in community outbreaks throughout the pandemic.

Community preparedness for implementation of pandemic influenza containment measures

1. Planning for disease control and containment

Local officials will face logistic, economic, ethical, legal, social, and psychological challenges in implementing disease control and containment measures during a Pandemic Alert and Pandemic Period. Although individual quarantine as a control measure is likely only to be used very early during the Pandemic Period—for example, among communities where initial cases are introduced into the U.S.

Key components of preparation include:

- Pandemic influenza containment exercises and drills with traditional partners (e.g., public health and healthcare workers) and non-traditional community partners (e.g., transportation workers)
- Identifying potential isolation and quarantine facilities
- Procedures for medical evaluation and isolation of quarantined persons who exhibit signs of influenza-like illness (ILI)
- Tools and mechanisms to prevent stigmatization and provide mental health services to persons in isolation or quarantine, as well as to family members of affected persons and other community members

- Procedures for delivering medical care, food, and services to persons in isolation or quarantine. These efforts should take into account the special needs of children and persons with disabilities.
- Issues related to employment compensation and job security

2. Legal preparedness

States, localities, and tribes have primary responsibility for public health matters within their borders, including isolation and quarantine. Under the authority of Section 361 of the Public Health Service Act (42 USC 264), the HHS Secretary may make and enforce regulations necessary to prevent the introduction, transmission, or spread of communicable diseases from foreign countries into the United States or from one state or possession into another. New International Health Regulations (IHR) were recently adopted by the World Health Assembly, which require member states to report cases of human infection caused by a new subtype. When WHO has determined that a particular event constitutes a public health emergency, the IHR require WHO to make a “real-time” response to the emergency.

3. Influenza clinics and hotlines

An influenza pandemic is likely to put great stress on the healthcare delivery system, in particular emergency departments. To prevent overwhelming demand from compromising the function of emergency departments, healthcare providers, organizations, facilities for screening, triage, and care of individuals with influenza-like illness will be opened. While the large majority of outpatient care during a pandemic will be provided by patients’ usual medical care practitioner, these special facilities will provide rapid medical assessment of potentially infected persons and basic outpatient and supportive care. Ill persons will be encouraged to call special influenza hotlines that provide advice on whether to stay home or to seek medical care. “Community triage” efforts may help prevent hospitals from being overwhelmed with patients who do not require hospital-level care. Moreover, community triage efforts may also reduce the number of uninfected persons who mingle with infected persons at clinics and hospitals.

Massachusetts is establishing and has established the following (see other sections of this plan):

- A system of Influenza Special Care Units (ISCUs) for care and triage. These ISCUs are being developed for mobilization by acute care hospitals in collaboration with local public health
- A telephone hotline is being put in place, based on the current hotline capacity of the MDPH and the utilization of Mass Support
- Systems to identify, register and credential volunteers are in place, including
 - Medical Reserve Corps in all regions
 - The Massachusetts System of Advanced Registration
 - The “Connect and Serve” program of the Massachusetts Emergency Management Agency
- Staff training is ongoing in behavioral health and mental health “first aid”
- A process of exploration of ethical issues and ethical standards for care delivered at an altered level is underway

4. Public understanding of disease containment measures

Community preparedness for implementation of both individual and community control measures can be enhanced by improving public understanding of the dangers of pandemic influenza and the benefits of disease control practices. Strategies for disease control will be facilitated by clear communication of the rationale for—and duration of—containment measures. Local public health education campaigns that involve community partners can build public confidence in the ability to cope with an influenza pandemic. Partners may include schools, faith-based organizations, community-based organizations, and other “civil society” institutions that can help educate the public and provide support to families and persons who are incapacitated by illness. Local public health campaigns should explain how individual action (e.g., strict compliance with respiratory hygiene,

staying home when ill) and community efforts (e.g., implementation of snow days and self-shielding) can help reduce disease transmission. Education campaigns can describe the criteria, justification, role, methodology, and duration of quarantine and the social, medical, and psychological ways in which persons will be supported during the quarantine period. They can also explain that quarantine—which temporarily restricts personal movement—is a collective action implemented for the common good. In addition, they can allay public concerns about privacy issues related to the provision of medical information to healthcare workers and public health officials. These key messages should be translated and modified as required to address the cultural and linguistic needs of local neighborhoods.

Massachusetts is establishing and has established the following (see other sections of this plan):

- Statewide awareness and education effort, including workshops, pandemic influenza continuity of operations exercises, curricula on infection control and personal protective equipment, video programs on pandemic influenza, public service announcements and a media campaign
- The healthcare demand surge planning process and the development of the ISCUs include planning for public education as to purpose and individual measures for protection, as well as plans to support families and special populations.

5. Enforcement and support of community containment measures

Experience from the 2003 SARS outbreak suggests that quarantine applied on a voluntary basis can be sufficient to reduce disease transmission. This idea is in accordance with data from modeling studies that suggest that quarantine and other community-based measures may be effective even if compliance is less than perfect. Nevertheless, officials should be prepared to enforce individual and community-based containment measures, if needed.

In place:

- Training programs for local public health and school officials as to authority to enforce measures
- Joint planning efforts with the Department of Education
- Incorporation of Homeland Security Presidential Directive - 8 (HSPD-8) planning activities with public health activities to assure effective communication and collaboration between public health and public safety officials
- Pre-prepared document templates to cover virtually any legal eventuality

Management of patients infected with novel strains of influenza and their contacts

1. Patient isolation

The influenza patient will be admitted to a hospital or other clinical facility (e.g, ISCU), if clinically indicated, if public health needs require it, or if isolation at home or in a community facility cannot be achieved safely and effectively.

The MDPH, in consultation with federal agencies, will advise healthcare providers and healthcare facilities on additional steps that may be taken, before and after laboratory test results become available, via the state public health laboratory or CDC.

2. Management of close contacts

In most situations—even at the earliest stages of a pandemic—it will not likely be possible to trace and quarantine close contacts of suspected or confirmed cases within 48 hours (the average incubation period for human influenza). However, in certain situations, especially during the later phases of the WHO Pandemic Alert Period, efforts to identify exposed individuals or groups might be recommended. Examples include:

- Suspected or confirmed cases of novel influenza. For example, a suspected or confirmed case of avian influenza A (H5N1) in persons who have traveled to an H5N1-affected country and have been exposed to sick poultry (either through handling or eating poultry products) or a laboratory-confirmed human case of H5N1 influenza
- Suspected or confirmed cases of avian influenza A (H5N1) or another novel strain of influenza in travelers on airplanes or cruise ships about to arrive in the United States
- Suspected or confirmed cases of avian influenza of any type in persons with known exposure to sick poultry or birds in the United States
- Clusters of avian influenza A (H5N1) or another novel strain of influenza in small, well defined settings, such as a military base
- Cases of laboratory exposure to avian influenza A (H5N1) or influenza viruses with the potential to cause a pandemic (e.g., influenza A [H2N2])

See attached guideline on the management of novel influenza strains and laboratory testing.

Decisions on whether to trace a patient's contacts and how to manage them will be made on a case-by-case basis in consultation with CDC, taking into consideration:

- Likelihood that the suspected case is due to a novel influenza strain (based on symptoms and travel history, if laboratory results are not yet available)
- Likelihood that the causative virus is transmitted from person-to-person with a moderate or high efficiency (as reflected in the designated Pandemic Alert phase)
- Feasibility of conducting contact-tracing given the short incubation period for influenza

A patient's close contacts may include family, friends, work colleagues, classmates, fellow passengers, and/or healthcare providers. Management of contacts will include passive or active monitoring without activity restrictions and/or quarantine at home or in a designated facility. In the Pandemic Alert Period, especially during Phase 3 or 4 when little or limited person-to-person transmission has been documented, quarantine of contacts should be implemented **only when there is a high probability that the ill patient is infected with a novel influenza strain that may be transmitted to others.**

The Massachusetts Department of Public Health (MDPH), the Boston Public Health Commission (BPHC) and the Boston Quarantine Station of the CDC Division of Quarantine and Global Migration (CDC-DQGM) have worked closely with MassPort on response and disease containment plans relevant to the above. See attached plan.

Contacts who are quarantined will be monitored by a health department official (or designee) at least once a day—by phone or in person—to assess symptoms and address any needs. Frequent monitoring (e.g., twice a day) will facilitate early detection, reducing the interval between the onset of symptoms and the isolation of the sick person. Early signs of influenza include fever, respiratory symptoms, and chills, rigors, myalgia, headache, or diarrhea. Quarantine may be lifted as soon as the exposed contact has remained without signs or symptoms of disease for a complete incubation period for influenza disease. (Experience with seasonal influenza suggests the incubation period is 1-4 days, with an average length of 2 days. However, the clinical behavior of a novel influenza virus may be different and could potentially be as long as 10 days. Pandemic influenza preparedness activities will consider containment measures that may last between 1-10 days. For the purposes of this document, 10 days is referred to as the incubation period; however, the time frame will be adjusted as more is known about the virus).

3. Data collection

Public health officials or designees (MDPH, BPHC, other local health agencies and CDC-DQGM) will collect information on cases and contacts, including:

- Number of contacts identified per case
- Information on each contact:
 - Relationship to the case-patient
 - Nature and time of exposure
 - Whether the contact was vaccinated or on antiviral prophylaxis
 - Underlying medical conditions
- Number of contacts (including any in quarantine) that become ill
- Number of days between onset of symptoms and reporting to health officials

These data will guide decision-making on whether to implement more stringent containment measures.

Containment of small clusters of infection with novel strains of influenza

Community-based control measures that might be of use to contain small clusters of infection with novel strains of influenza (during the later Pandemic Alert phases or when cases are first introduced into the U.S.) include targeted chemoprophylaxis and early detection of new cases by use of influenza hotlines and clinics. These approaches may be implemented in small, well defined settings. They are not likely to be useful once a pandemic is underway.

1. Targeted chemoprophylaxis of disease clusters

This intervention includes investigation of disease clusters, administration of antiviral treatment to persons with confirmed or suspected pandemic influenza, and provision of drug prophylaxis to all likely exposed persons in the affected community. CDC will assist state health departments in these efforts, as needed. Targeted chemoprophylaxis also requires intensive disease surveillance to ensure coverage of the entire affected area, effective communication with the affected community, and rapid distribution and administration of antivirals because they are most effective when provided within 48 hours of symptom onset or when used as post-exposure prophylaxis before onset of illness

2. Influenza hotlines and clinics

During the later phases of a Pandemic Alert, in a community experiencing a disease cluster, a combination of self-assessment and establishment of influenza hotlines may be effective in detecting potential influenza disease and conducting “community triage” to direct persons with symptoms to the appropriate site and level of care. This intervention includes asking all members of the affected community to monitor their symptoms in accordance with instructions from the state health department and CDC. Designated healthcare workers will determine whether the patient’s symptoms are likely due to pandemic influenza, to a different contagious disease, or to a noncontagious condition. If a person is judged likely to be infected with influenza, they will be referred for isolation and care as needed.

THE PANDEMIC PERIOD

During the Pandemic Period, control measures such as contact tracing and quarantine applied to individuals will have limited impact in decreasing influenza transmission. In addition, individual-level measures will no longer be feasible. During this stage, the state and local health departments will implement measures that decrease social contact within groups or whole communities and measures that individuals can take personally to decrease their risk of infection. While there is limited evidence in regard to community level measures¹, these may serve to reduce transmission sufficiently to blunt the full impact of the pandemic influenza wave. Individual measures applied on a community level do

¹ World Health Organization Writing Group. Nonpharmaceutical Interventions for Pandemic Influenza, International Measures. *Emerg Infect Dis* 2006; 12: 81-87.

World Health Organization Writing Group. Nonpharmaceutical Interventions for Pandemic Influenza, National and Community Measures. *Emerg Infect Dis* 2006; 12: 88-94.

have evidence of efficacy² and efforts to raise awareness of these measures have been ongoing for several years and will be enforced in the pandemic alert and pandemic periods.

Containment measures for individuals

1. Patient isolation

A patient with a suspected or confirmed case of pandemic influenza should be separated from persons who are well, using recommended infection control measures. If a surge in patients overwhelms healthcare capacity or if home isolation is not feasible, patients who can be taken care of in ISCUs will be triaged to the appropriate ISCU and provided with assistance to get there, if needed.

2. Management of contacts

Because the usefulness and feasibility of these measures will be limited once the pandemic has started, community-based measures that reduce disease transmission by increasing social distance will be promoted. Public education will be targeted to providing contacts information about personal surveillance for signs and symptoms of influenza and reducing the risk of their transmitting influenza to others.

Community-based containment measures

If disease transmission in the community is significant and sustained, community-based containment measures will be implemented. Implementation will be based on surveillance data and feasibility, as well as concern regarding not implementing measures that may be more disruptive to societal operations than pandemic influenza they are attempting to control.

Quarantine of groups of exposed persons

The purpose of quarantine is to reduce influenza transmission by separating exposed persons from others, monitoring exposed persons for symptoms, and providing medical care and infection control precautions as soon as symptoms are detected. Quarantine will be implemented on an as needed basis, with consultation among state and local public health officials.

Groups that might be quarantined include:

- Persons who might have been exposed to an influenza case
- Via family members
- At a public gathering
- On an airplane or cruise ship or other closed
- At their school or workplace
- Healthcare providers who work at a facility where influenza cases receive care

Group quarantine (like patient isolation) is optimally performed on a voluntary basis, in accordance with instructions of healthcare providers and health officials. Basic legal authority to compel mandatory isolation and quarantine of individuals and groups when necessary to protect the public's health is provided under law and regulation (see 105 CMR 300).

Measures that apply to use of specific sites or buildings

Two ways of increasing social distance are to cancel events and close buildings or to restrict access to certain sites or buildings. These measures are sometimes called "focused measures to increase social distance." Depending on the situation, examples of cancellations and building closures might include:

- Cancellation of public events (concerts, sports events, movies, plays)

² Lo JY, et al. Respiratory Infections during SARS Outbreak, Hong Kong, 2003. *Emerg Infect Dis* 2005; 11: 1738-41.

- Closure of recreational facilities (community swimming pools, youth clubs, gymnasiums)

Measures that affect communities

Measures that affect entire communities (including both exposed and non-exposed persons), include:

- Promotion of community-wide infection control measures (e.g., respiratory hygiene/cough etiquette)
- Snow days and self-shielding
- Closure of office buildings, shopping malls, schools, and public transportation (e.g., subways, buses)
- Widespread community quarantine (cordon sanitaire)

As community outbreaks of pandemic influenza occur, community-wide infection control measures may decrease the overall magnitude of the outbreak. Community-based measures may also include school closures, snow days, and selfshielding.

Community-wide infection control measures

Throughout a pandemic, public health authorities will encourage all persons with signs and symptoms of a respiratory infection, regardless of presumed cause, to:

- Cover the nose/mouth when coughing or sneezing.
- Use tissues to contain respiratory secretions.
- Dispose of tissues in the nearest waste receptacle after use.
- Perform hand hygiene after contact with respiratory secretions and contaminated objects or materials.

Persons at high risk for complications of influenza will be advised to avoid public gatherings (e.g., movies, religious services, public meetings) when pandemic influenza is in the community. They should also avoid going to other public areas (e.g., food stores, pharmacies); the use of other persons for shopping or home delivery service is encouraged.

Disposable surgical-type masks are used by healthcare workers taking care of ill patients to prevent splashes and droplets of potentially infectious material (e.g., from coughs and sneezes) from reaching the mucous membranes of the healthcare worker's nose or mouth. The benefit of wearing masks by well persons in public settings has not been established. In contrast to healthcare workers who necessarily have close contact with ill patients, the general public should try to avoid close contact with ill individuals. Nevertheless, persons may choose to wear a mask as part of individual protection strategies that include cough etiquette, hand hygiene, and avoiding public gatherings. Mask use may be most important for persons who are at high risk for complications of influenza and those who are unable to avoid close contact with others or must travel for essential reasons such as seeking medical care. Public education will be provided on how to use and dispose of masks appropriately.

Snow days and self-shielding

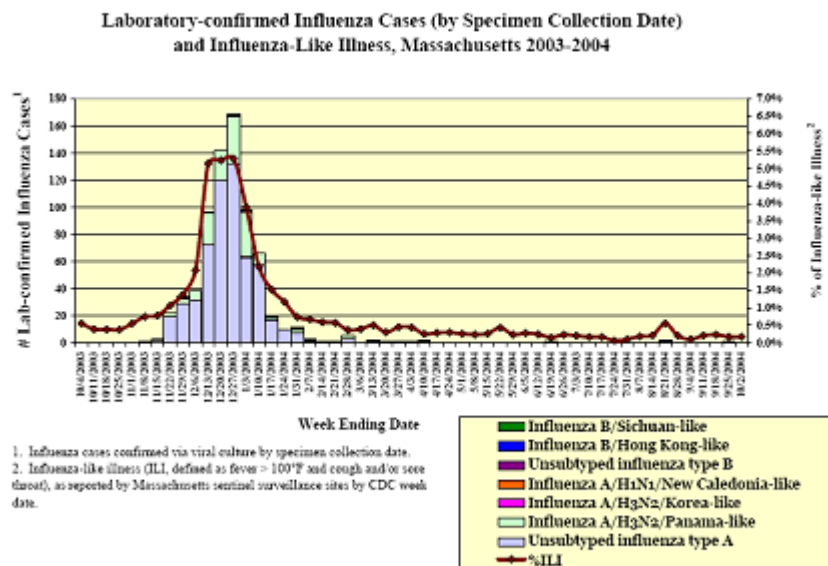
Implementation of "snow days"—asking everyone to stay home—involves the entire community in a positive way, is acceptable to most people, and is relatively easy to implement. Snow days may be instituted for an initial 10-day period, with final decisions on duration based on an epidemiologic and social assessment of the situation. The public will be instructed in the acquisition and storage of necessary provisions including type and quantity of supplies needed during snow days. Snow days can effectively reduce transmission without explicit activity restrictions (i.e., quarantine). Consideration will be given to personnel who maintain primary functions in the community (e.g., law enforcement personnel, transportation workers, utility workers [electricity, water, gas, telephone, sanitation]). Compliance with snow days might be enhanced by "self-shielding" behavior (i.e., many people may stay home even in the absence of an official snow day ["reverse quarantine"]).

Community Containment Plan

Although data are limited, school closures may be effective in decreasing spread of influenza and reducing the overall magnitude of disease in a community. In addition, the risk of infection and illness among children is likely to be decreased, which would be particularly important if the pandemic strain causes significant morbidity and mortality among children. Children are known to be efficient transmitters of seasonal influenza and other respiratory illnesses. Anecdotal reports suggest that community influenza outbreaks may be limited by closing schools. Results of mathematical modeling also suggest a reduction of overall disease, especially when schools are closed early in the outbreak. During a Pandemic Period, parents should be encouraged to consider child care arrangements that do not result in large gatherings of children outside the school setting.

Since school closures may be effective in slowing down influenza transmission in the community, and certain school buildings must be adapted to other purposes (ISCUs), a plan has been developed for school closures for a two-week period of time at the exponential phase of influenza transmission. This containment plan is based on the premise that the most impact from school closure can be achieved during the exponential phase of the initial wave of pandemic influenza. This plan is certainly subject to change based on new models of transmission and empiric observations.

Over the past ten years, the Massachusetts Department of Public Health has had several seasonal influenza surveillance systems in place, including surveillance for influenza-like illness (ILI) by sentinel practitioners across the state. This system has been demonstrated to have efficacy in predicting and tracking influenza activity, as measured by correlation with laboratory testing and surveillance for viral isolates (see chart). Additionally, syndromic surveillance systems put in place for bioterrorism surveillance have demonstrated the capacity to predict influenza hospitalization and death by 2-3 weeks. These surveillance systems could allow the prediction of peaks of pandemic influenza activity by two weeks, as there are indicators that signal the exponential growth rate of transmission.



The use of sentinel ILI surveillance (and syndromic surveillance data, as it becomes available) as a trigger for community containment depends on certain assumptions. First, we must assume that the time course of pandemic influenza transmission in the community is similar to that of seasonal

influenza. One would expect that pandemic influenza would behave like a severe influenza season. The 2003-04 influenza season was moderately severe, but because of an early start of the season and significant genetic drift between the vaccine strain of influenza A/H3N2/Panama and the circulating strain H3N2/Fujian resulting in a mismatch, the influenza activity peaked early and high before the December holidays. The rapid drop off in activity over the holidays might also be instructive of the effect of school closure. The only other relatively severe influenza season in recent years, with a well-defined peak occurred in 2004-05. The chart below demonstrates the pattern of ILI in Massachusetts during these two seasons.

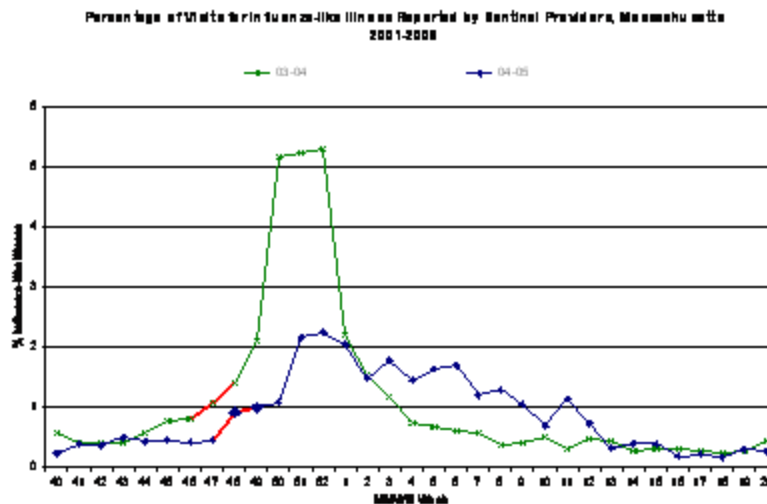
The second major assumption is that the surveillance system will behave the same in the pandemic circumstances as it does in ordinary influenza seasons. During ordinary influenza season, completeness of reporting ILI is not very good in the earliest part of the season. While one would expect that there will be very little time to report the volume of ILI during the peak of pandemic influenza, there actually should be high motivation to report ILI as we wait for the first wave of pandemic influenza to hit. Thus, one might expect ILI surveillance in the early part of the pandemic period to be atypical in being as complete as possible, so it may be more sensitive to shifts in incidence rather than less, at least until the peak in activity is approached. However, it should be noted that heightened surveillance will also affect the baseline observations of ILI and might make this baseline unstable. Careful monitoring of trends, combined with other observations, needs to be in place to avoid “false alarms”.

Observations of the behavior of ILI incidence in Massachusetts suggest that an exponential growth in influenza activity occurs after two weeks of more gradual increase in ILI incidence, with approximately a doubling of ILI activity over baseline, over two weeks, prior to the exponential growth phase. Two weeks later, peaks of activity are observed. See the figure below, the red segments represent the predictive observations. ILI surveillance may allow us to predict the peak of pandemic influenza activity, therefore the need for ISCUs and other measures to be implemented, by two weeks. The exponential growth phase of the pandemic wave would be the most likely time that closure of schools would result in significantly decreased transmission and the blunting of the peak.

The containment plan would be based on close observation of ILI trends with school closings for two weeks during the exponential phase of transmission. This trigger for school closing would also be the signal to begin preparations for opening ISCUs in 10-14 days.

Information developing from studies of syndromic surveillance of outpatient electronic medical records suggest that ILI in children under 5 years of age is a predictor of influenza in other age groups, giving a signal two weeks before the increase in adult cases. Furthermore, intensity of influenza activity correlates with the proportion of the community population under the age of 18 years. While more work is necessary in this area, a robust syndromic surveillance system for febrile respiratory disease may allow us to segment the state as far as influenza activity is concerned and time school closings and ISCU mobilization differently in different parts of the state. The MDPH will continue to pursue this collaborative research effort to acquire more information about feasibility of application. However, the current plan will depend on sentinel ILI surveillance.

School closings will have secondary effects in reducing social interaction as some parents stay home and other activities are cancelled or curtailed. This may obviate the need for further community level quarantine and containment activities.

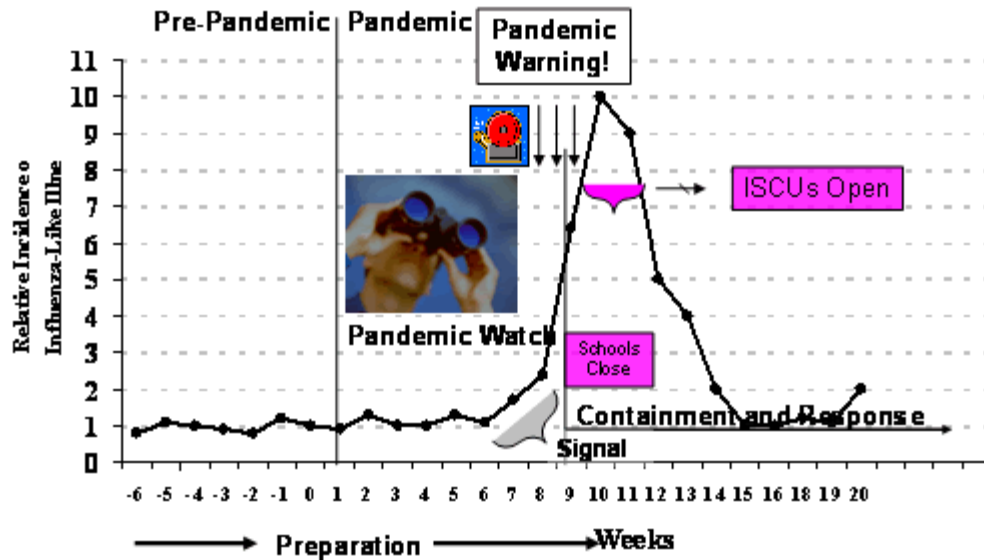


New terminology will be adopted for implementing the school closure plan based on ILI surveillance. The "Pandemic Watch" will be instituted when WHO Phase 6 begins. ILI monitoring will begin, looking for an increase in ILI from baseline as an indicator of incipient exponential growth. Naturally, this plan will need modification if pandemic influenza in the United States is first observed in Massachusetts. The "Pandemic Warning" period would be the two weeks between the observation of the trigger and the peak in activity, which would coincide with school closures and activities being implemented to respond to the peak in activity. The actual impact of school closings will be monitored closely.

Plan:

- Pandemic Alert progresses to Pandemic
- Pandemic Watch in effect
 - ILI surveillance
 - Syndromic surveillance
- Surveillance indicators of influenza activity increasing over two weeks
- Pandemic Warning declared
 - Schools closed for two weeks
 - ISCUs mobilized
- School opening considered depending on whether peak has evidently passed (see below)
- ISCUs standing down
- Pandemic influenza wave passes

Model of Trigger for Special Containment Measures and Response



Scaling back community containment measures

The decision to discontinue community-level measures must balance the need to lift individual movement restrictions against community health and safety. Premature removal of containment strategies can increase the risk of additional transmission. Decisions will be based on evidence of improving local/regional control, such as:

- Consistent decrease in the number of confirmed cases
- Reduction in the number of probable and known cases
- Effective protective countermeasures are in place (e.g., high coverage with a pandemic influenza vaccine)

Table for Social Distancing and Containment

Measure	Pandemic Alert	Early Pandemic	Pandemic	Trigger/Recs
Isolation of symptomatic confirmed or high risk case	Yes	Yes, if numbers are small , until resources exceeded	If possible (encourage case to self isolate)	Based on financial and staffing issues
Closure of schools to slow spread of infection	No	Yes	Consider(must consider benefit of closing schools in terms of congregate exposure versus disassociative interaction if children out of school associate with children they would not associate with in school)	Trigger: -two-fold increase in ILI reports -similar increase in syndromic surveillance for febrile respiratory illness -absenteeism -insufficient staff due to illness to ensure safety of children
Respiratory hygiene/cough etiquette	Yes	Yes	Yes	
Face coverage or surgical/procedure masks for confirmed cases	Yes	Yes	Yes	Use in appropriate settings such as home when around others
Face coverage or surgical/procedure masks for asymptomatic closely exposed persons (to a confirmed case or a high risk suspect)	Consider	Consider	Consider	Surgical masks should be used in HC settings
Face coverage or surgical/procedure mask for asymptomatic unexposed persons	No	No	Consider in some settings (i.e., when in large gatherings where close contact is anticipated)	
Recommend avoiding close contact with ill persons	Yes	Yes	Yes	
Tracing and follow-up of contacts of confirmed cases	Yes	Yes/No depending on resources	No (but in certain high risk settings may consider)	Based on number of contacts under surveillance and ability to rapidly trace contacts
Tracing and follow-up of contacts of high risk suspect case	Yes	Yes/No depending on resources	No	Criteria for stopping contact tracing after early phase needs to be developed

Tracing and follow-up of contacts of low risk suspect case	No	No	No	
Voluntary quarantine of healthy close contacts of a confirmed case or high risk suspect	Yes	Possibly, very early	Possibly	
Voluntary isolation of symptomatic close contacts of a confirmed case	Yes	Yes	Yes	
Voluntary isolation of symptomatic close contacts of a pending low risk case	Yes/No depending on the situation	No	N/A	
Voluntary isolation of symptomatic close contacts of a pending high risk case	Yes	Yes	Yes	
Recommend antivirals for contacts	Yes	Yes	No	Dependent on availability
Restrict travel	No	Based on CDC recommendations	Based on CDC recommendations	Suspect cases should not travel – all phases; refer to CDC
Recommend deferring unnecessary travel to affected areas	No/Consider	Consider	No	
Entry screening	No	Consider	No	Based on CDC recommendations

Exit screening	No	Yes	No	Based on CDC recommendations
Infection control	Droplet/standard Consider airborne infection isolation and respiratory protection in health care settings	Droplet/standard	Droplet/standard	
Promote respiratory hygiene/cough etiquette	Yes	Yes	Yes	
Cancel non-essential large public gatherings	No	Consider	Consider	Based on epi of cases could include-# of confirmed cases/100,000 pop within city
Recommend "snow days"	No	Consider	Consider	Telecommuting, teleconferencing Based on epi of cases could include-# of confirmed cases/100,000 pop within city/region/etc.
Activate triage centers	No	Yes, as peak of cases approaches	Yes , 24/7 if ISCU's open	-% of ED visits attributable to ILI -%increase in EMS calls -EMS offload times
Establish influenza hotlines or automated information lines	No	Yes	Yes	Cases identified within US -Staffing a hotline for 8-12 weeks would be tough
ISCUs	No	Yes, as needed	Yes, as needed	Need to make sure these are feasible to operate and staff -%of ILI incidence peaking -bed availability

CONTAINMENT MEASURES: TERMS AND DEFINITIONS

Isolation is the separation and restriction and movement or activities of ill infected persons (patients) who have a contagious disease, for the purpose of preventing transmission to others.

Quarantine is the separation and restriction of movement or activities of persons who are not ill but who are believed to have been exposed to infection, for the purpose of preventing transmission of disease. Individuals may be quarantined at home or in designated facilities; healthcare providers and other response workers may be subject to quarantine when they are off duty.

Quarantine of close contacts refers to the quarantine of individuals exposed to patients with communicable diseases (e.g., family members, work or school mates, healthcare workers).

Quarantine of groups of exposed persons refers to quarantine of people who have been exposed to the same source of illness (e.g., a case of influenza at a public gathering, on an airline, train, or cruise ship, at a school or workplace or apartment complex, or at a recently visited store or office).

Widespread or community-wide quarantine refers to the closing of community borders or the erection of a real or virtual barrier around a geographic area (a cordon sanitaire) with prohibition of travel into or out of the area.

Self-shielding refers to self-imposed exclusion from infected persons or those perceived to be infected (e.g., by staying home from work or school during an epidemic).

Snow days are days on which offices, schools, transportation systems are closed or cancelled, as if there were a major snowstorm.

Influenza clinics are special facilities that may be established during a pandemic to provide rapid medical assessment of potentially infected persons. Ill persons would be encouraged to call influenza hotlines that provide advice on whether to stay home or seek help at an influenza clinic. Persons who come to an influenza clinic will be advised on whether they may be best served by hospital care or home care.

Individual-level containment measures include isolation of patients and management of their close contacts.

Focused measures to increase social distance (or decrease social contact) includes measures applied to groups rather than individuals or whole communities (e.g., quarantine of groups of exposed persons and measures that apply to the use of specific sites or buildings).

Containment measures that apply to use of specific sites or buildings include cancellation of public events (e.g., concerts, sports events, movies and plays), closure of office buildings, apartment complexes, or schools; and closure of subways or bus lines. These measures may also involve restricting entrance to buildings or other sites (e.g., requiring fever screening or use of face masks before entry to schools, worksites, or airplanes).

Community-based measures to increase social distance include measures applied to whole neighborhoods, towns, or cities (e.g., snow days, establishment of fever clinics, and community-wide quarantine).

POTENTIAL THRESHOLD DETERMINANTS FOR THE USE OF COMMUNITY CONTAINMENT MEASURES

Data on cases and contacts—as well as on depletion of healthcare and public health resources over the course of a pandemic—can help make decisions of when to implement community-level containment measures. State and local health agencies and healthcare partners may estimate at what point in the pandemic—in terms of such variables as numbers of cases and numbers of unoccupied hospital beds—that more extensive measures may be imposed. During an actual pandemic, state and local departments may also evaluate social considerations, such as levels of community cooperation and mobility.

Potential parameters	Variable
Cases and contacts	Number of cases (absolute or estimated) Rate of incident cases Number of hospitalized cases Number and percentage of cases with no identified epidemiologic link Morbidity (including disease severity) and mortality Number of contacts under surveillance and/or quarantine
Healthcare resources	Hospital/facility bed capacity Staff resources Patient/staff ratio Number of ill or absent staff members Availability of specifically trained specialists and ancillary staff members Availability of ventilators Availability of other respiratory equipment Availability of personal protective equipment and other measures Availability of therapeutic medications (influenza and non-influenza specific)
Public health resources	Investigator to case and contact ratios Number of contacts under active surveillance Number of contacts under quarantine Ability to rapidly trace contacts (number of untraced/interviewed contacts) Ability to implement and monitor quarantine (staff member to contact ratio) Ability to provide essential services (food, water, etc.)
Community cooperation, mobility and compliance	Degree of compliance with voluntary individual isolation Degree of compliance with active surveillance and voluntary individual quarantine Degree of movement out of the community Degree of compliance with community-containment measures

COMMUNITY CONTAINMENT MEASURES

Management of cases and contacts (including quarantine)

- Case surveillance
- Clinical evaluation and management
- Contact tracing, monitoring, and management
- Reporting criteria
- Guidelines for home and non-hospital isolation and quarantine.
- Supplies for non-hospital management of cases and contacts.
- Hotlines and other services for:
 - Case and contact monitoring and response
 - Fever triage
 - Public information
 - Provider information
- Provision of essential services and supplies to persons in isolation and quarantine, keeping in mind the special needs of children. Services and supplies include:
 - Food and water
 - Shelter
 - Medicines and medical consultations
 - Mental health and psychological support services
 - Other supportive services (e.g., day care or elder care)
 - Transportation to medical treatment, if required
- Financial support, job security, and prevention of stigmatization.
- Procedures for medical evaluation and isolation of quarantined persons who exhibit signs of illness.
- Monitoring and enforcing quarantine measures, such as:
 - Follow-up of persons who cannot be reached by telephone. These may include a threshold period for nonresponsiveness that should trigger a home visit or other means to locate the person. Partnerships with law enforcement and other community-based resources will be helpful in tracing the whereabouts of persons who have violated restrictions.
 - Monitoring persons who cannot or will not comply with voluntary home quarantine. These include:
 - Issuing official, legally binding quarantine orders
 - Posting a guard outside the home
 - Using electronic forms of monitoring
 - Using guarded facilities

Community containment measures

Legal authorities and procedures are in place to implement the various levels of movement restrictions as necessary.

Procedures for medical evaluation and isolation of quarantined persons who exhibit signs of illness. Tools and mechanisms to prevent stigmatization and provide mental health services to persons in isolation or quarantine.

Key partners and personnel for the implementation of movement restrictions, including quarantine, and the provision of essential services and supplies:

- Law enforcement
- First responders
- Other government service workers

- Utilities
- Transportation industry
- Local businesses
- Schools and school boards

Procedures for delivering medical care, food, and services to persons in isolation or quarantine.

Training for responders and healthcare workers, as necessary, in use of personal protective equipment
Mobilization and deployment of public health and other community-service personnel

RECOMMENDATIONS FOR QUARANTINE

General considerations

- Monitor each quarantined person daily, or more frequently if feasible, for fever, respiratory symptoms, and other symptoms of early influenza disease.
- Monitor compliance with quarantine through daily visits or telephone calls.
- Provide a hotline number for quarantined persons to call if they develop symptoms or have other immediate needs.
- If a quarantined person develops symptoms suggestive of influenza, arrangements should be in place for separating that person from others in quarantine and ensuring immediate medical evaluation.
- Provide persons in quarantine with all needed support services, including 1) psychological support, 2) food and water, 3) household and medical supplies, and 4) care for family members who are not in quarantine. Financial issues, such as medical leave, may also need to be considered.
- Collect data related to quarantine activities to guide ongoing decision-making including information on each person quarantined:
 - Relationship to the case-patient
 - Nature and time of exposure
 - Whether the contact was vaccinated or on antiviral prophylaxis or using PPE
 - Underlying medical conditions
 - Number of days in quarantine
 - Symptom log
 - Basic demographics
 - Compliance with quarantine

Based on current available data, the recommended duration of quarantine for influenza is generally 10 days from the time of exposure. (This period may be adjusted based on available information during a pandemic.) At the end of the designated quarantine period, contacts should have a final assessment for fever and respiratory symptoms. Persons without fever or respiratory symptoms may return to normal activities.

Home quarantine

Whenever possible, contacts should be quarantined at home. Home quarantine requires the fewest additional resources, although arrangements must still be made for monitoring patients, reporting symptoms, transporting patients for medical evaluation if necessary, and providing essential supplies and services. Home quarantine is most suitable for contacts with a home environment that can meet their basic needs and in which unexposed household members can be protected from exposure. Other considerations include:

- Persons in home quarantine must be able to monitor their own symptoms (or have them monitored by a caregiver).

- The person's home should be evaluated for suitability before being used for quarantine, using a questionnaire administered to the quarantined person or the caregiver.
- Quarantined persons should minimize interactions with other household members to prevent exposure during the interval between the development and recognition of symptoms. Precautions may include 1) sleeping and eating in a separate room, 2) using a separate bathroom, and 3) appropriate use of personal protective equipment.
- Persons in quarantine may be assessed for symptoms by either active or passive monitoring. Active monitoring of contacts in quarantine may overcome delays resulting from the insidious onset of symptoms or denial among those in quarantine.
- Household members may go to school, work, etc., without restrictions unless the quarantined person develops symptoms. If the quarantined person develops symptoms, household members should remain at home in a room separate from the symptomatic person and await additional instructions from health authorities.
- Household members can provide valuable support to quarantined persons by helping them feel less isolated and ensuring that essential needs are met.
- Immediate and ongoing psychological support services should be provided to minimize psychological distress.
- Quarantined persons should be able to maintain regular communication with their loved ones and healthcare providers.

Quarantine in designated facilities

In some cases, affected persons may not have access to an appropriate home environment for quarantine. Examples include travelers; persons living in dormitories, homeless shelters, or other group facilities; and persons whose homes do not meet the minimum requirements for quarantine. In other instances, contacts may have an appropriate home environment but may not wish to put family members at risk. In these situations, health officials should identify an appropriate community-based quarantine facility. Monitoring of quarantined persons may be either passive or active, although active monitoring may be more appropriate in a facility setting. Facilities designated for quarantine of persons who cannot or choose not to be quarantined at home should meet the same criteria listed for home quarantine. Evaluation of potential sites for facility-based quarantine is an important part of preparedness planning.

Working quarantine

This type of quarantine applies to healthcare workers or other essential personnel who are at occupational risk of influenza infection. These groups may be subject to quarantine either at home or in a designated facility during off-duty hours. When off duty, contacts on working quarantine should be managed in the same way as persons in quarantine at home or in a designated facility. Local officials should:

- Monitor persons in working quarantine for symptoms during work shifts
- Promptly evaluate anyone who develops symptoms
- Provide transportation to and from work, if needed
- Develop mechanisms for immediate and ongoing psychological support

At the end of the designated quarantine period, contacts should receive physical (fever and respiratory symptoms) and psychological health assessments. Persons without fever or respiratory symptoms may return to normal activities. Persons who exhibit psychological distress should be referred to mental health professionals for additional support services.